# AFRD QUEST PROGRAM GUIDE

Accelerator and Fusion Research Division
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## CONTENTS

**WHAT IS QUEST? ..... Page 3**

**WHAT ARE QUEST TEAMS? ..... Page 4**

**WHAT DO QUEST TEAMS DO? ..... Page 4**
**Workplace Assessments** p. 4
- **Team Meetings** p. 4
- **Recordkeeping and Follow-up** p. 5
- **Can QUEST Teams Do More?** p. 5

**HOW IS QUEST RELATED TO OTHER AFRD ACTIVITIES? ..... Page 6**
- **Supervisor Safety Plans** p. 6-7
- **Program ES&H Committees** p. 8
- **AFRD ES&H Operations Committee** p. 8
- **Program Heads Meetings** p. 9
- **LBNL and Division Self-Assessment** p.9

**QUEST TOOLS ..... Page 10**
- **QUEST Team Roster** p. 11
- **ES&H/QA Concerns Report** p. 12
- **QUEST Meeting Report** p. 13
- **QUEST ES&H Checklists** p. 14-26
  - **Waste Minimization/Management Checklist** p. 14-15
  - **Office Checklist** p. 17-18
  - **Lab Checklist** p. 19-22
  - **Shop Checklist** p. 23-27

**QUALITY ASSURANCE and QUALIT Y IMPROVEMENT ..... Page 28**
- **LBNL Requirements** p. 27
- **Quality Assurance at AFRD** p. 28
- **Quality Assurance Checklist** p. 29-31

## WHAT IS QUEST?

**QUEST** is an integrated way to examine **QU**ality Assurance/Improvement and **E**nvironment, Safety, and Health through **S**elf-Assessment and **T**eamwork. Its basic premise is that teams composed of employees actually performing the work of the Programs are in the best position to evaluate the quality and safety of their workplace.

The main objective of QUEST is the identification and mitigation of any condition or process that jeopardizes the safety and health of employees, protection of the environment, or the quality of AFRD research or operations. The QUEST process involves all long-term AFRD personnel to raise awareness of ES&H and quality issues and develop the habit of identifying, reporting, and resolving potential problems before accidents or occurrences result. QUEST teams are also encouraged to identify opportunities for improvement, examine each of these opportunities, and implement those actions that they believe will lead to the improvement desired.

AFRD management reviews and update the QUEST program annually. Following is a brief history of QUEST:

- QUEST was developed in 1994. It was revised as QUEST-II in 1996.
- The April 1998 update aligned the QUEST program with the Lab Integrated Safety Management System by incorporating QUEST into the AFRD ES&H Management Plan. The October 1998 update provided greater flexibility to teams in deciding how to implement QUEST.
- The January 2000 update established an annual QUEST review as the required minimum level of QUEST participation and revised the Quality Assurance aspects of self-assessment.
- The 2001, 2002, and 2003 update revised the QUEST Fundamentals checklist and the Quality Assurance section.
- The 2004 update provided special checklists in preparation for the January 2004 OSHA inspection.
- The 2005 update incorporated items from the updated LCATS checklists and a new Waste Minimization and Management checklists.
- The 2006 update integrated the QUEST program with supervisor safety walkthroughs mandated by the Laboratory Director.
- The 2007 update returns to QUEST teams organized by location. Behavior observations were added to checklists. The Quality Assurance section incorporates requirements of the new LBNL Quality Assurance Plan. Quality and environmental protection are incorporated into Supervisor Safety Plans. The Guide was reorganized for clarity and to reduce redundancy.

## WHAT ARE QUEST TEAMS?

All AFRD personnel (including Division employees, matrixed employees, visitors, temporary employees, students, and participating guests) are assigned to at least one QUEST self-assessment team, with the exception of short-term personnel (persons whose participation in AFRD work activities at LBNL are anticipated to occur over a period of less than 90 days/year). Persons whose participation in work activities at AFRD are anticipated to occur over a period of less than 90 days may be included in a QUEST team as determined by the Program Head. **For 2007, the teams will be organized by work groups sharing work locations.**

AFRD ALS Accelerator Physics Program personnel are assigned to ALS Division Safety Circles, which function as the ALS QUEST teams.

## WHAT DO QUEST TEAMS DO?

Each team member should have an active role to play in some facet of QUEST activities each year, such as updating the team roster, doing a self-assessment inspection, discussing concerns or taking minutes at meetings, entering findings into the Corrective Action Tracking System, or resolving corrective actions.

### Workplace Assessments

Each team will have charge of self-assessment for the workspace of its members. Program ES&H Coordinators must coordinate team assignments to ensure the annual inspections cover all the Program space at LBNL. ALS Accelerator Physics personnel will participate in ALS Division QUEST activities, as directed by the ALS ES&H Coordinator.

**Each QUEST team is required to perform an assessment of workplace safety and environmental hazards at least once during the QUEST self-assessment period (February 2007, with the exception of ALS).** Us of the applicable ES&H Checklists are required. If teams see other safety concerns that are not on the checklists, they should be reported as well. Any observations of unsafe behaviors should be noted without using names of people observed. Use of the Quality Assurance checklist is an optional activity for QUEST teams, at the discretion of the Program Head.

### Team Meetings

**Each QUEST team must meet at least once during the QUEST self-assessment period.** All team members are encouraged to attend. At the meeting, the team will discuss the workplace inspection findings and solicit additional reports of concerns from team members. Team members are encouraged to report any other work-related environmental, health, safety, or quality assurance concerns.

## Recordkeeping and Follow-up

Each QUEST team will maintain a record of its activities including a list of members **(QUEST Team Roster)**, minutes and attendance rosters for all meetings **(QUEST Meeting Report)**, copies of inspection findings including actions taken or planned **(ES&H/QA Concerns Report)**. The team leader will provide copies of these documents to the Program ES&H Coordinator. Copies of all documents will be maintained in the Program office to provide validation for our annual Division self-assessment report.

**The QUEST Team members** (if they know how) **or Program ES&H Coordinator will enter unresolved ES&H action items into the Corrective Action Tracking System (CATS) database,** assigning responsibility for the action items to an appropriate person for follow-up. The Program ES&H Coordinator will discuss the unresolved concerns at the AFRD ES&H Operations Committee meeting.

## Can QUEST Teams Do More?

Program Heads may establish additional requirements for QUEST activities within their Program.

In addition to the required annual inspection, QUEST teams are encouraged to remain active throughout the year. Team meetings are one way of providing feedback to the team on the actions that have been taken as a result of the concerns team members have identified. QUEST team meetings are also an opportunity to pass along relevant information from the AFRD ES&H committees. Some QUEST teams find value in meeting periodically throughout the year. Appropriate meeting topics include any issue affecting safety, the environment, or quality assurance. Teams are encouraged to choose topics that are "local issues" and fit their needs.

Teams may choose to perform additional assessments of particular areas or aspects of their work. If deficiencies are uncovered, corrections should be made immediately when practical, or recorded in CATS for further action. Items requiring the assistance to correct, or for which additional guidance is needed should be promptly referred to the AFRD ES&H Administrator through the Program ES&H Coordinator.

## HOW IS QUEST RELATED TO OTHER AFRD ACTIVITIES?

### Supervisor Safety Plans

Section 3.1 of the new LBNL Quality Assurance Plan requires LBNL managers at all levels to regularly assess the performance of their organizations and functions. **At AFRD, assessment and communication of quality, safety, and environmental protection are integrated in Supervisor Safety Plans. Each AFRD supervisor is expected to maintain a Supervisor Safety Plan approved by his/her Program Head.** This plan contains the supervisor's commitment to carrying out specific safety communication, inspection, and improvement activities appropriate to their work group. (Program Heads may require plans from other employees having safety leadership responsibility.)

At the end of each quarter of the Performance Year, the AFRD ES&H Administrator will ask each Program ES&H Coordinator to collect information regarding the activities their Supervisor Safety Plan holders have actually performed during the quarter. Program ES&H Coordinators should direct their Program Head's attention to plans that are not being fully implemented. Program Heads should discuss the difficulties in implementing the plans with the responsible people and determine whether efforts need to be increased or plans amended to reflect actual practices.

QUEST assessments and Supervisor Safety Plan walkthroughs are complimentary activities. QUEST raises safety awareness, involves everyone in the Division in improving safety, and encourages teamwork and communication. Supervisor Safety Plans reinforce ongoing Line Management Responsibility. **QUEST checklists may be used by supervisors throughout the year** as guidance in performing their walkthroughs. **A supervisor who participates in an assessment of his/her work areas with their QUEST team may receive credit for a Supervisor Safety Plan walkthrough for this activity.** An assessment of work areas by other personnel during QUEST without the supervisor's active participation cannot be substituted for the supervisor's commitment to perform a walkthrough.

ALS may designate different requirements for AFRD's ALS Accelerator Physics personnel.

**AFRD SUPERVISOR SAFETY PLAN**

Prepared by:_____ Accepted by:_____

Supervisor name /date Program Head name/date

**SELF-ASSESSMENT** *Describe how you personally assess the quality assurance, safety, and environmental protection of your group's workplace conditions and activities, including walkthroughs of spaces and observation of activities. [AFRD expectation: supervisor walkthrough at least quarterly]*

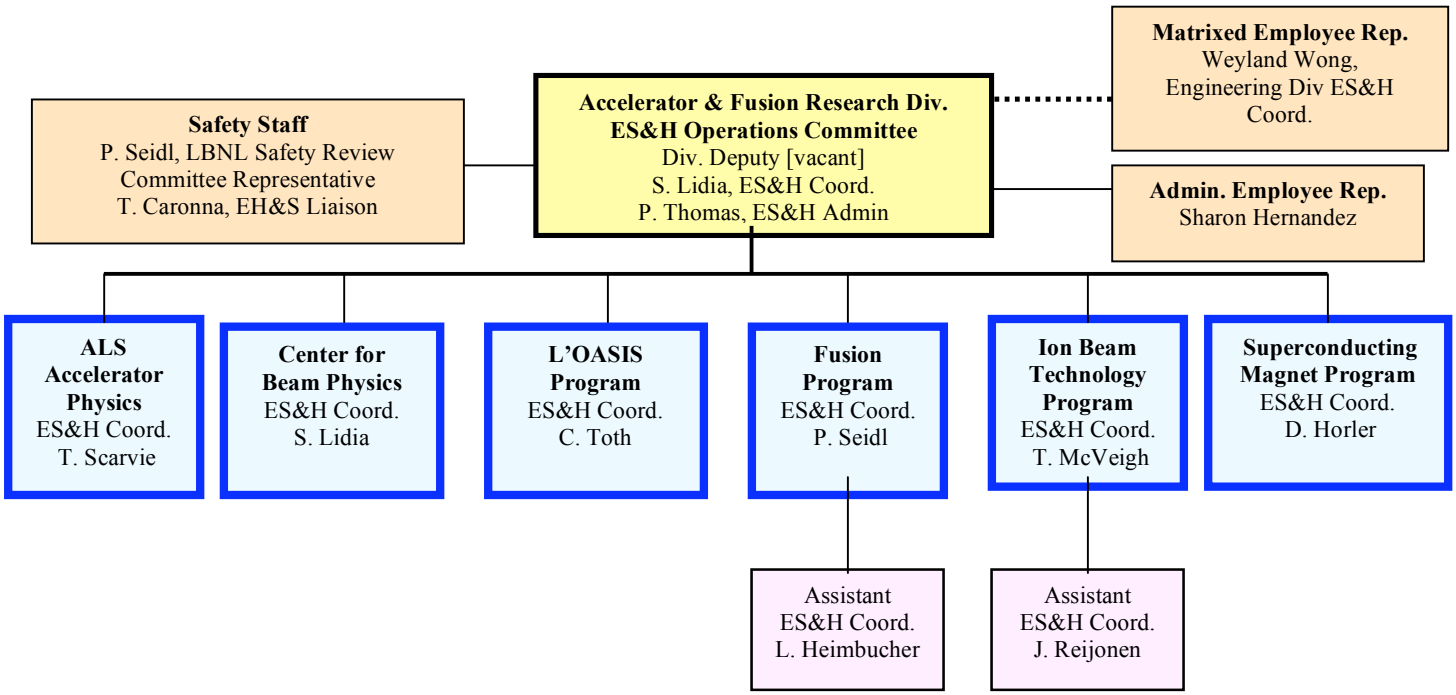
**COMMUNICATIONS** *Describe how you (1) communicate quality, safety, and environmental protection information to your group and (2) receive and address concerns from your group. [AFRD expectation: group meeting where safety (and aspects of quality and environmental protection as needed), are discussed at least weekly.]*

## Program ES&H Committees

Programs may have their own ES&H Committees, consisting of current QUEST team leaders, the Program ES&H Coordinator, and others designated by the Program Head. Program ES&H Committees meet at the discretion of the AFRD Program Head . ES&H Committee meetings may be held in conjunction with another Program meeting.

## AFRD ES&H Operations Committee

At the Division level, the AFRD ES&H Operations Committee coordinates most ES&H program implementation activities. The AFRD ES&H Operations Committee consists of the Program ES&H Coordinators, the AFRD ES&H Administrator, the AFRD ES&H Coordinator, and representatives for administrative and matrixed employees. This committee, working in conjunction with Program ES&H Committees and QUEST teams, is the primary conduit for ES&H information both to and from LBNL and AFRD management. The EH&S Division Liaison is also invited to the meetings of this committee. Meetings are held monthly, usually on the first Friday of the month. At the meeting, the committee members discuss ES&H concerns and lessons learned from them. The AFRD ES&H Coordinator and/or Administrator pass on any information on lab-wide ES&H programs and problems that have arisen.



## Program Heads Meetings

The AFRD Program Heads meetings are chaired by the AFRD Director and consist of the AFRD Program Heads and Project Leaders for major projects, and key business management personnel. This group usually meets about once a month. The AFRD ES&H Coordinator and/or AFRD ES&H Administrator communicate current safety information and concerns at each meeting. The Director and Program Heads make policy decisions about the division safety program and provide feedback and direction to the AFRD ES&H Operations Committee.

## LBNL and Division Self-Assessment

The Laboratory has implemented a self-assessment system that AFRD fully supports and in which the Division actively participates. This system includes the following assessments:

- Management Environment, Safety, and Health (MESH) reviews, conducted by the LBNL Safety Review Committee, review how well the management systems described in our AFRD Integrated Safety Management Plan are functioning.
- Integrated Functional Appraisals (IFA), performed by teams of EH&S Division specialists who make comprehensive inspections of selected AFRD operations.
- Division Self-Assessments, performed annually by each Division, measure the implementation of the Division Integrated Safety Management Plans against performance criteria.

QUEST is an important part of this system. We assess the quality and safety of the locations where we work and correct many deficiencies. To avoid duplicated effort, the IFA and MESH teams can review our QUEST action items in the CATS database and then focus on more difficult to identify deficiencies and opportunities for management system improvements.

The annual Division Self-Assessment report is compiled (by the AFRD ES&H Administrator) by reviewing QUEST reports, findings from Supervisor Safety Walkthroughs, and other performance information such as accident reports, regulatory agency inspection reports, and findings of IFA and MESH assessments. QUEST findings help us identify ways of improving our ES&H systems. Our Division ES&H Self-Assessment Report is submitted to the Division Director and the Office of Institutional Assurance. Findings and performance ratings of all the Division Self-Assessments are rolled up in an ES&H self-assessment report to LBNL management. Some of the self-assessment performance statistics are used in performance measure scores for LBNL's contract with the U.S. Department of Energy.

**QUEST TOOLS**

**QUEST Team Roster ……. Page 11**
This form is used to list the members of your team. (While not a requirement, you may select a name for your team.) **The current team rosters must be maintained in the Program office.**

**AFRD QUEST Team ES&H/QA Concerns Report……..Page 12**
This form is used by QUEST team members to submit concerns to their Team Leader.

**QUEST Meeting Report……..Page 13**
This form is designed for recording team meetings.

**QUEST ES&H Checklists**
These checklists are used by QUEST team members for their assessments and may be used by Supervisors to guide their walkthroughs.

**Waste Minimization and Management……Pages 14-15**
**Offices……..Pages 16-17**
**Labs……..Pages 18-21**
**Shops…….Pages 22-26**

**QUEST Team Roster**

Program:_____

Team Name (optional):_____

Team Leader:_____

Assessment Area(s):_____

| **Employee Name** | **Employee ID #** |
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**AFRD QUEST Team**
**ES&H/QA Concerns Report**

**Please submit completed forms to Program ES&H Coordinator**

**Date Found:_____**
**Name(s) of Finder(s)*:_____**
**Program:_____**
_____
**Concern:**

Location: Bldg:_____ Room and/or Area:_____

Description:
_____
_____
_____
_____
_____

Status:
___ Resolved (date)_____
___ Will be resolved by this team, or
___ Referred to ES&H Coordinator, or
___ Referred to _____
_____
**Concern:**

Location: Bldg:_____ Room and/or Area:_____

Description:
_____
_____
_____
_____
_____

Status:
___ Resolved (date)_____
___ Will be resolved by this team, or
___ Referred to ES&H Coordinator, or
___ Referred to _____

**QUEST Meeting Report**

*Please submit copy of completed forms to ProgramES&H Coordinator*

**A**FRD

**QU**ality **E**S&H **S**elf-Assessment **T**eamwork

Team Leader_____

Program:_____

Date:_____

**QA/ES&H Topic(s) of Discussion**:

**Items of ES&H/QA Concern:**

1._____
_____

Resolved Immediately ☐ **or** (DATE)_____

Will be Resolved by this team ☐ **or**

Referred to ES&H Coordinator ☐ **or**

☐ Referred to:_____

2._____
_____

Resolved Immediately ☐ **or** (DATE)_____

Will be Resolved by this team ☐ **or**

Referred to ES&H Coordinator ☐ **or**

☐ Referred to:_____

3._____
_____

Resolved Immediately ☐ **or**

Will be Resolved by this team ☐ **or**

Referred to ES&H Coordinator ☐ **or**

☐ Referred to:_____ **or**

**QUEST Meeting Report (page 2)**

**Attendance (please print)**

| | |
|---|---|
| | |
| | |
| | |
| | |
| | |

## QUEST SELF-ASSESSMENT CHECKLIST
## for WASTE MINIMIZATION AND MANAGEMENT

---

### WORKPLACE WASTE

Are sharps disposed in approved red containers, labeled as sharps containers, with biohazard symbol removed or crossed out?

---

Are there any computers, monitors, or other electronic equipment that are not being used that could be recycled or disposed?

---

Are there green battery buckets available in convenient locations for battery recycling?

---

Are there conveniently located recycling bins for white and mixed paper? Are they being used correctly?

---

Look at some wastebaskets. Are recyclable materials being kept out of the trash?

---

### SATELLITE ACCUMULATION AREAS

Is the Satellite Accumulation Area (SAA) near the point the where the waste is generated? Can access to the SAA be controlled by the responsible person (locked up or within visual contact from work area?)?

---

Has an SAA sign been posted at each hazardous waste accumulation area? Has the sign been filled out completely and accurately with the name of the responsible person, building/room, telephone number, and type of waste?

---

Is there a Hazardous Waste label attached to each container? Is the label filled out with the name and phone number of the generator, building/room location, type of waste, hazards, waste form (solid/liquid), and accumulation start date?

---

Are there any wastes that have been in the SAA for more than 9 months?

---

Are all waste containers in good condition (not leaking, bulging, etc.)?

---

Are liquid waste containers stored in secondary containment pans that are large enough to hold the entire contents of the largest container?

---

Are containers kept closed, except when waste is being added or removed (no funnels left in containers)?

---

**DUMPSTERS and BINS**

Do dumpsters have properly functioning lids so rainfall cannot get inside them?

_____

Are dumpsters and bins labeled with the waste type and being used for their proper purpose?
*Examples:*

- no trash in recycling bins,
- no recyclable materials in trash dumpsters,
- correct waste type in recycling bins,
- no electronic waste such as computers or monitors in dumpsters or bins,
- no liquids in dumpsters or bins.

_____

Is the area around the dumpsters and bins being kept clean (no overflowing waste, spills, or leaks)?

_____

Are dumpsters and bins positioned so that they do not obstruct traffic, emergency egress, or pedestrian pathways?

_____

Are recycling bins conveniently located near waste sources?

_____

## QUEST SELF-ASSESSMENT CHECKLIST
## for OFFICES

### EMERGENCY PREPAREDNESS

Has up-to-date emergency information been posted (evacuation routes, assembly areas, contact people and phone numbers)?

_____

Are aisles, walkways, stairways, and exit doors unobstructed? Is the area free of tripping hazards?

_____

Have all heavy objects that could fall during an earthquake been secured safety (no bungee cords)?

_____

Is fire extinguisher access unobstructed?

_____

### ELECTRICAL SAFETY

Is access to electrical panels, including breaker boxes and disconnects, unobstructed?

_____

Does each electrical panel have a schedule posted nearby indicating the purpose of all breakers and disconnects? Are all breakers and disconnects numbered or otherwise identified?

_____

Are electrical panels and breaker boxes in good condition (intact, screws in place, door latches work, no materials stored on top)?

_____

Are all receptacles and outlets in good condition?

_____

Are labeled ground fault circuit interrupters (GFCIs) located on electrical outlets near water outlets and other areas where they may get wet?

_____

Are power / extension cords in good condition (ground prong, jackets in good condition, no frayed insulation or exposed wiring, no evidence of modification)? Are unused extension cords rolled up and stored properly?

_____

Are extension cords used properly (not draped over furniture or fire sprinkler lines, appropriate for the load, taped down or covered with a bridge in walkways, not extending through doors or windows, not attached to additional extension cords)?

_____

Are power strips in good condition and used properly (not daisy chained; not permanently attached; not connected to equipment over 600 Watts/5 amps, such as heaters, cooking appliances, or fans)?

_____

Are electrical conduits free of attached cord, lines, equipment, decorations or other materials?

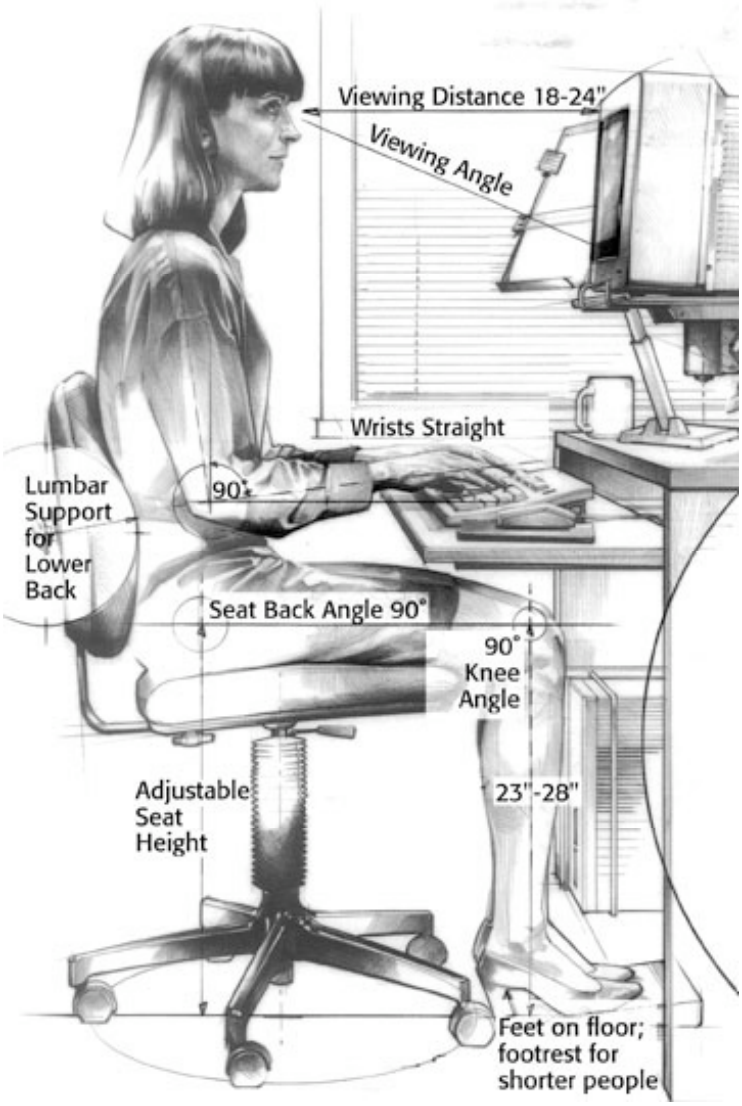
**ERGONOMICS**

Does each chair or stool with wheels have a 5-legged base?

_____

Are there any people in the area who would like to request an ergonomic evaluation?

_____




**OFFICE WORK BEHAVIOR OBSERVATIONS**

Computer work: feet flat on floor or on footrest; back erect or slightly reclined and well-supported; wrists straight; head and neck straight forward or slightly down; avoids overextending reach; stretches periodically

_____

Lifting: test weight before lifting; gets help with large/awkward items; avoid awkward body positioning; bends knees when lifting; avoid bending over, twisting, overextending; checks path for hazards before carrying

## QUEST SELF-ASSESSMENT CHECKLIST
## for LABS

_____

### GENERAL SAFETY

Are interlock test procedures posted or readily available? Are interlock systems tested at least twice yearly (posted record of test within the last 6 months)?

_____

Are current work authorizations (AHDs, RWAs, SSAs, LMAs) posted or readily available for experiments that require them? Are lists of authorized personnel up-to-date?

_____

Is appropriate foot protection being used where there is risk of foot injuries?

_____

Are sharp cutting tools (razor blades, scalpels, knives, etc.) stored with the blade covered?

_____

Does each chair or stool with wheels have a 5-legged base?

_____

### EMERGENCY PREPAREDNESS

Are entrances and work areas posted with the appropriate hazard warnings, emergency contact names, and telephone numbers?

_____

Are aisles, walkways, stairways, and exit doors unobstructed? Is the area free of tripping hazards?

_____

Have all heavy objects that could fall during an earthquake been secured safely (no bungee cords)?

_____

Is fire extinguisher and safety shower/eyewash access unobstructed?

_____

Have eyewashes and safety showers been inspected within the last 3 months?

_____

Are there adequate numbers and types of spill kits (e.g., flammable, acid, and base) available in work areas?

_____

**ELECTRICAL SAFETY**

Is access to electrical panels, including breaker boxes and disconnects, unobstructed?

_____

Does each electrical panel have a schedule posted nearby indicating the purpose of all breakers and disconnects? Are all breakers and disconnects numbered or otherwise identified?

_____

Are electrical panels and breaker boxes in good condition (intact, screws in place, door latches work, no materials stored on top)?

_____

Are all receptacles and outlets in good condition?

_____

Are labeled ground fault circuit interrupters (GFCIs) located on electrical outlets near water outlets and other areas where they may get wet?

_____

Are power / extension cords in good condition (ground prong, jackets in good condition, no frayed insulation or exposed wiring, no evidence of modification)? Are unused extension cords rolled up and stored properly?

_____

Are extension cords used properly (not draped over furniture or fire sprinkler lines, appropriate for the load, taped down or covered with a bridge in walkways, not extending through doors or windows, not attached to additional extension cords)?

_____

Are power strips in good condition and used properly (not daisy chained; not permanently attached; not connected to equipment over 600 Watts/5 amps, such as heaters, cooking appliances, or fans)?

_____

Are all the necessary components (locks, tags) available to perform LOTO? Are equipment-specific LOTO procedures posted where required?

_____

Are cable trays properly grounded and used correctly (not overfilled, electrical and water lines separated)?

_____

Are all unused openings (including conduit knockouts) in electrical enclosures and fittings closed with appropriate covers, plugs, or plates?

_____

Are portable metal ladders clearly labeled "Do Not Use Around Electrical Equipment" and kept away from areas where the ladder or person using the ladder could come in contact with energized equipment?

_____

Are electrical conduits free of attached cord, lines, equipment, decorations or other materials?

_____

Is electrical equipment on metal carts or tables bonded, and grounding provided for metal carts used for electrical equipment?

## CHEMICAL SAFETY

Are floors and work surfaces free of chemical residues?

_____

Are chemical containers and gas cylinders in good condition (not leaking, rusted, dented, etc.)?

_____

Are chemical containers and gas cylinders labeled with name of chemical contents and hazard?

_____

Do workers know how to find and use Material Safety Data Sheets?
*Pick a chemical container or gas cylinder. Ask a worker in the area to show you the MSDS and identify the hazards of the chemical.*

- Does the worker know what an MSDS is?
- Can they quickly produce a current MSDS (either hard copy or from the website)?
- Can they find the hazard information?

_____

Has appropriate protective equipment (gloves, respirators, eyewear, shoes, etc.) been selected, made readily available, stored properly, and kept in good condition?

_____

Are chemicals and gases stored properly?
*Examples:*

- Acids separated from bases?
- Corrosives (acids and bases) separated from flammables and toxics?
- Acetic acid stored with flammables?
- Flammables >10 gal. stored in flammables cabinet?
- Flammables and gas cylinders protected from heat and sources of ignition?
- Stored in approved containers, tightly closed and covered when not in use?
- Containment pans under liquids?
- Gas cylinders secured by metal bracket, top and bottom chains, or on a cart secured to prevent rolling or tipping?
- Regulators removed from gas cylinders not in use?
- Chemicals and gases stored away from stairs and exits?
- Overhead storage shelves equipped with shelf lips or latched doors?
- Hazardous liquids stored away from sinks and drains?

_____

Are areas where food/drink are stored and consumed clearly separated from areas where chemicals are stored or used?

_____

Are fume hoods uncluttered (air flow not blocked)? Is there a sticker indicating the hood has been inspected and tested within the last two years?

_____

Have potential lead hazards been identified and controlled (lead bricks and shielding covered, lead not needed for shielding removed from work areas, no old paint peeling or chipping)?

_____

## SUSPECT/COUNTERFEIT PARTS

Do key personnel know how to identify and report suspect parts?

_____

Are periodic inspections of facilities, equipment, spaces and parts stocks being conducted to identify suspect parts?

_____

Are high strength fasteners (bolts, nuts, screws, and washers) certified and controlled since purchase? Are certifications for installed high-strength fasteners available for review?

_____

Are the following types of items assessed for possible suspect/counterfeit parts when received through procurement or obtained from other groups:

- High-strength fasteners (bolts, nuts, screws, washers);
- Electrical/electronic components (circuit breakers, current and potential transformers, fuses, resistors, switch gear, overload and protective relays, motor control centers, heaters, motor generator sets, DC power supplies, AC inverters, transmitters, computer components, semiconductors);
- Piping components (fittings, flanges, valves and valve replacement products, couplings, plugs, spacers, nozzles, pipe supports);
- Pre-formed metal structures;
- elastomers (O-rings, seals);
- spare/replacement kits from suppliers other than the original equipment manufacturer;
- weld filler material;
- diesel generator speed governors; and
- pumps?

## LAB WORK BEHAVIOR OBSERVATIONS

Lifting: test weight before lifting; gets help with large/awkward items; avoid awkward body positioning; bends knees when lifting; avoid bending over, twisting, overextending; checks path for hazards before carrying

_____

PPE: wears protective equipment appropriate to the job. Consider eye/face protection (goggles, face shield, safety glasses), gloves, hearing protection, foot protection, respiratory protection, clothing (lab coat, coveralls, apron).

_____

Procedures: plans work, identifies hazards, ensures controls are effective, gets permits/work authorizations, checks condition of equipment before using, follows written procedures, obeys signs, performs LOTO when needed, leaves equipment and work area in clean and safe condition

## QUEST SELF-ASSESSMENT CHECKLIST
## for SHOPS

---

### GENERAL SAFETY

Are ladders clean and in good condition, with non-slip safety feet?

---

Are safety glasses available and in use in eye hazard areas?

---

Is appropriate foot protection being used where there is risk of foot injuries?

---

Are sharp cutting tools (razor blades, scalpels, knives, etc.) stored with the blade covered?

---

Does each chair or stool with wheels have a 5-legged base?

---

### EMERGENCY PREPAREDNESS

Are entrances and work areas posted with appropriate hazard warnings, contact people and phone numbers?

---

Are aisles, walkways, stairways, and exit doors unobstructed? Is the area free of tripping hazards?

---

Have all heavy objects (furniture, computers, large equipment) that could fall during an earthquake been secured safely (no bungee cords)?

---

Is fire extinguisher and safety shower/eyewash access unobstructed?

---

Have eyewashes and safety showers been inspected within the last 3 months?

---

Are there adequate numbers and types of spill kits (e.g., flammable, acid, and base) available in work areas?

---

**ELECTRICAL SAFETY**

Is access to electrical panels, including breaker boxes and disconnects, unobstructed?

_____

Does each electrical panel have a schedule posted nearby indicating the purpose of all breakers and disconnects? Are all breakers and disconnects numbered or otherwise identified?

_____

Are electrical panels and breaker boxes in good condition (intact, screws in place, door latches work, no materials stored on top)?

_____

Are all receptacles and outlets in good condition? Are outlets near machines protected from metal chips?

_____

Are labeled ground fault circuit interrupters (GFCIs) located on electrical outlets near water outlets and other areas where they may get wet?

_____

Are power / extension cords in good condition (ground prong, jackets in good condition, no frayed insulation or exposed wiring, no evidence of modification)? Are unused extension cords rolled up and stored properly?

_____

Are electrical feeds to machines in good condition and grounded?

_____

Are extension cords used properly (not draped over furniture or fire sprinkler lines, appropriate for the load, taped down or covered with a bridge in walkways, not extending through doors or windows, not attached to additional extension cords)?

_____

Are power strips in good condition and used properly (not daisy chained; not permanently attached; not connected to equipment over 600 Watts/5 amps, such as heaters, cooking appliances, or fans)?

_____

Are all the necessary components (locks, tags) available to perform LOTO? Are equipment-specific LOTO procedures posted where required?

_____

Are portable metal ladders clearly labeled "Do Not Use Around Electrical Equipment" and kept away from areas where the ladder or person using the ladder could come in contact with energized equipment?

_____

Are electrical conduits free of attached cord, lines, equipment, decorations or other materials?

_____

Is electrical equipment on metal carts or tables bonded, and grounding provided for metal carts used for electrical equipment?

## MACHINE GUARDING AND CONTROLS

Are machine guards in place where needed to prevent workers or falling objects from making contact with moving parts, the point of operation, ingoing nip points, rotating parts, flying chips, and sparks?

_____

Are starting and stopping controls within easy reach of the operator? Are machines protected from restarting automatically after a power interruption?

_____

For grinders, is the work rest adjusted closely to the wheel with a maximum clearance of 1/8 inch, and the adjustable tongue or end of the peripheral member at the top of the housing adjusted to within 1/4" of the wheel?

_____

Are machines designed for a fixed location securely anchored to prevent movement?

_____

Is there sufficient clearance around and between machines to allow for safe operations, set up and servicing, material handling and waste removal?

_____

## CRANES, HOISTS, and FORKLIFTS

Do lifting cables have inspection tags?

_____

Is secondary lifting gear in good condition?

_____

Is each pendant cable tagged with an LBNL "Warning, to Avoid Injury" tag?

_____

Is there an LBNL Proof Load Tag on the hoist? Does the load limit on the tag match the marking on the hoist? Is the rated load of each hoist legibly marked and visible to the operator?

_____

Are the controls of hoists plainly marked to indicate the direction of travel or motion?

_____

Is there a daily inspection tag or logbook? Is it being filled out whenever the crane/hoist is in use?

_____

When forklift trucks are left unattended, are the forks lowered, controls neutralized, hand brake set, wheels chocked, and keys removed from the ignition?

_____

Do all forklift trucks have seat belts?

_____

## CHEMICAL SAFETY

Are floors and work surfaces free of chemical residues?

_____

Are chemical containers and gas cylinders labeled with name of chemical contents and hazard?

_____

Do workers know how to find and use Material Safety Data Sheets? *Pick a chemical container or gas cylinder. Ask a worker in the area to show you the MSDS and identify the hazards of the chemical.*

- Does the worker know what an MSDS is?
- Can they quickly produce a current MSDS (either hard copy or from the website)?
- Can they find the hazard information?

_____

Has appropriate protective equipment (gloves, respirators, eyewear, shoes, etc.) been selected, made readily available, stored properly, and kept in good condition?

Are chemicals and gases stored properly?

- Acids separated from bases?
- Corrosives (acids and bases) separated from flammables and toxics?
- Acetic acid stored with flammables?
- Flammables >10 gal. stored in flammables cabinet?
- Flammables and gas cylinders protected from heat and sources of ignition?
- Stored in approved containers, tightly closed and covered when not in use?
- Containment pans under liquids?
- Gas cylinders secured by metal bracket, top and bottom chains, or on a cart secured to prevent rolling or tipping?
- Regulators removed from gas cylinders not in use?
- Chemicals and gases stored away from stairs and exits?
- Overhead storage shelves equipped with shelf lips or latched doors?
- Hazardous liquids stored away from sinks and drains?

_____

Are areas where food/drink are stored and consumed clearly separated from areas where chemicals are stored or used?

_____

Has the performance of local ventilation systems been checked within the past two years (signed and dated inspection sticker?

_____

## SUSPECT/COUNTERFEIT PARTS

Do key shop personnel know how to identify and report suspect parts?

_____

Are periodic inspections of facilities, equipment, spaces and parts stocks being conducted to identify suspect parts?

_____

Are high strength fasteners (bolts, nuts, screws, and washers) certified and controlled since purchase? Are certifications for installed high-strength fasteners available for review?

_____

Are the following types of items assessed for possible suspect/counterfeit parts when received through procurement or obtained from other groups:

- High-strength fasteners (bolts, nuts, screws, washers);
- Electrical/electronic components (circuit breakers, current and potential transformers, fuses, resistors, switch gear, overload and protective relays, motor control centers, heaters, motor generator sets, DC power supplies, AC inverters, transmitters, computer components, semiconductors);
- Piping components (fittings, flanges, valves and valve replacement products, couplings, plugs, spacers, nozzles, pipe supports);
- Pre-formed metal structures;
- elastomers (O-rings, seals);
- spare/replacement kits from suppliers other than the original equipment manufacturer;
- weld filler material;
- diesel generator speed governors; and
- pumps?

## SHOP WORK BEHAVIOR OBSERVATIONS

Lifting: tests weight before lifting; gets help with large/awkward items; avoids awkward body positioning; bends knees when lifting; avoid bending over, twisting, overextending; checks path for hazards before carrying

_____

PPE: wears protective equipment appropriate to the job. Consider eye/face protection (goggles, face shield, safety glasses), gloves, hearing protection, foot protection, respiratory protection, clothing (lab coat, coveralls, apron).

_____

Procedures: plans work, identifies hazards, ensures controls are effective, gets permits/work authorizations, checks condition of equipment before using, follows written procedures, obeys signs, performs LOTO when needed, leaves equipment and work area in clean and safe condition

_____

Tool use: selects the right tool for the job; only uses tools and equipment the worker is trained and authorized to use; ensures tools are in good condition and guards in place before using; uses proper techniques; does not work alone in shop

# QUALITY ASSURANCE and QUALITY IMPROVEMENT

## LBNL Requirements

It is the policy of LBNL to carry out all our activities in a reliable, safe, and high quality manner. It is line management's responsibility to set and execute annual performance objectives. In addition, every LBNL employee is individually responsible for the quality and safety of his/her work. Our quality program emphasizes three principles:

- The most essential resources at LBNL are the creative scientists, engineers, and support personnel.
- People who perform the work have the greatest effect on outcome and process quality.
- Problem prevention is more cost-effective than problem correction.

The basic implementing elements and guidelines of LBNL's Quality Assurance (QA) system are found in Chapter 8 of the Regulations and Procedures Manual and the **Quality Assurance Plan (QAP), PUB-3111** (see LBNL website A-Z index under "Q"). The QAP describes the elements necessary to integrate quality assurance, safety management, and conduct of operations requirements into operations. The Office of Institutional Assurance (OIA) maintains the QAP and manages the LBNL Assurance Program.

The QAP requires all LBNL organizations to maintain documents and/or websites that describe the organization, mission, and scope of work. Each Program has the opportunity to devise its own methods of addressing the basic documentation requirements described in the QAP. Many of the requirements are already met by LBNL or General Sciences documents. Programs only need to develop documentation for procedures that are unique to their operations. Documents may be kept in Program/Project files, control rooms, desktop notebooks, or electronically. Facility and Function Notebooks are not required. The Program Head should maintain records of what the essential documents are and where they are kept.

Section 3.1 of the LBNL QAP requires LBNL managers at all levels to regularly assess the performance of their organizations and functions. The scope of the assessments should include:

- Planning;
- Organizational interfaces,
- Integration of management systems (safety, security, quality, project management);
- Organizational effectiveness;
- Use of performance metrics;
- Training and metrics;
- Supervisory oversight and support.

## Quality Assurance at AFRD

**AFRD Supervisors should incorporate relevant aspects of the QA checklist into their Supervisor Safety Plan walkthroughs.** The LBNL QAP says management assessments should include evaluation of employee knowledge, motivation, and morale; communication among workers; the existence of an atmosphere of creativity and improvement; and the adequacy of human and materials resources. The assessments should involve direct observation of work so that the manager is aware of the interactions at the work location. The observations can be supplemented with worker and customer interviews, safety and performance documentation reviews, and drills or exercises.

**The use of the QA checklist by QUEST teams is an optional activity at the discretion of the Program Head.**

QA findings will be directed to the attention of AFRD management through the Program Heads meetings. QA issues that are limited to a particular Program or Project will be referred to the Program Head or Project Leader for resolution. When QA issues are identified that may affect multiple Programs/Projects, the Division Director may request Program Heads/Project Leaders to designate representatives to serve on special committees to address particular concerns or quality improvement efforts. The results of these special committee efforts will be reported to AFRD management for review and approval. AFRD Management will identify appropriate action items to be entered into CATS for tracking.

The following checklist is for QUEST teams or supervisors that wish to assess and improve their QA systems.

## QUEST SELF-ASSESSMENT CHECKLIST
## for QUALITY ASSURANCE

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### ORGANIZATION, PLANNING, AND STAFFING

**Organization Structure:** Check the website for your Program and work group. Does it include accurate descriptions of the Program and its work groups, including:

- group names,
- mission and core functions,
- organization chart,
- roles and responsibilities?

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**Work Planning:** Are work planning documents for your group easy to find and identify? Do the documents effectively address:

- funding and allocation of resources,
- scheduling of activities and milestones,
- roles, responsibilities, and training of work group personnel,
- requirements for drawings, procedures, data management, and technical reports,
- identification of work authorization and ES&H requirements,
- security needs for information systems and equipment,
- performance measures, tracking of progress, corrective actions, and status reports?

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**Staff Proficiency--Documentation:** Ask group members to check the documents that demonstrate their proficiency and verify that they are accurate and up-to-date, including:

- position descriptions,
- Job Hazards Questionnaires (updated within the last 12 months or more recently if job hazards or assignments have changed).

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**Staff Proficiency--Orientation:** Ask new people in your group about the orientation they received. Did it include introductions to key personnel, policies, work procedures, management expectations, hazards and safety requirements?

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### EQUIPMENT DESIGN, TESTING AND MAINTENANCE

**Design:** For each design, are there records of:

- design basis and performance criteria;
- codes, standards, and regulatory requirements;
- ES&H considerations (where applicable);
- Security considerations (where applicable);
- Independent technical review and management review and approval;
- Document control process and revision status?

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**Equipment testing and maintenance:** Is equipment serviced, inspected, tested, and calibrated in accordance with manufacturer's recommendations, regulations, and procedures? Are nonconforming items taken out of service, marked, and segregated (if feasible) to ensure they are not used?

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## OPERATING PRACTICES

**Operating practices—controls:** Are there controls in place to prevent unauthorized personnel from activating hazardous equipment or distracting authorized personnel during critical operations?

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**Operating practices—shift change:** Are there logbooks or other reliable methods for passing critical information such as work instructions, staff or equipment status changes, abnormal conditions, etc. to incoming staff?

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## PROCUREMENT AND PROPERTY MANAGEMENT

**Procurement -- ordering:** Do group members know and follow the procedures for purchasing items needed for their work? Are there processes and controls in place to ensure adequate consideration of safety, project schedule, cost, quality, and technical specifications when procuring items?

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**Procurement – receiving:** When items are received, are they inspected to ensure the items match the description in the order, are in good condition, and function properly? Are unacceptable items separated from good ones, reported to procurement, and returned promptly? Are new property assets bar-coded, inventoried, and assigned to an appropriate "custodian"?

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**Property management--inventory:** Are property assets assigned to "custodians" who are current LBNL employees with knowledge about the assets' location and condition? Do custodians know how to find and follow procedures for properly reporting changes in location, status, or ownership of property to the AFRD Property Representative?

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**Property management—storage:** Are items stored under conditions that prevent damage, loss, or deterioration? Are any special storage needs identified (packaging, shelf life, temperature/moisture, etc.)?

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**Property management--security:** Are there adequate safeguards in place to prevent theft or damage to property from malicious acts, including: maintenance of vehicle use logs, removing keys from vehicles when not in use, locking buildings when no one is present, sufficient lighting in work and storage areas?

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**Property management—shipping/transportation/disposal:** Do group members know how to find the requirements for packing, moving, shipping, and disposing of the materials and equipment they use?

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## DATA, DOCUMENT, AND RECORDS MANAGEMENT

**Information and communication:** Do LBNL and Program information systems provide the information you need to do your job? Is the information timely and accurate? Is it easy to find and use?

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**Cybersecurity:** Do all computers have up-to-date virus protection software and security patches? Are passwords chosen in accordance with LBNL guidelines, changed frequently, and not written down where they are easy to find?

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**Procedures:** Are there written procedures readily available for important or complex work processes? Are the procedures, current, accurate, and complete? Do the procedures contain:

- Approval signatures and effective date,
- Title and revision number,
- Purpose and scope,
- Definitions of acronyms and special terms,
- Work steps with responsibilities and controls,
- References for sources of requirements?

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**Data collection:** Do data collection and analysis procedures:

- Ensure data is traceable to the data collection or sampling activity;
- Ensure the data collection, sampling, and analysis equipment is properly functioning and calibrated?
- Conform with accepted standards or references, where applicable;
- Include data/sample handling and custody requirements;
- Adequately and accurately identify samples and data sets (how, when, where, by whom was it produced);
- Utilize the most appropriate statistical analysis methods;
- Provide for maintenance of records?

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**Records management:** Does the administrative staff maintain a records or file inventory? Have they been trained in Archives and Records requirements?

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**Scientific and technical publications:** Have documents intended for publication been processes through the Report Coordination Office (check for assigned report number)? Is there a current list of qualified AFRD reviewers?

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**ASSESSMENTS AND IMPROVEMENTS**

**Assessments:** Does the group conduct its own management assessments? Are periodic assessments (i.e., QUEST and others) being performed?

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**Improvements:** Are deficiencies related to reliability, quality and safety identified and tracked in the CATS database and closed in a timely manner? Are lessons learned and best practices shared within and between work groups?

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